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AN
EXPERIMENTAL
COURSE
OF
ASTRONOMY.

Desaguliers (J. T.)

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☞ *This Courſe begins on* Tuesday — *the*
th *Day of* february 172$\frac{4}{5}$ *at* eleven *in the* morning

Channel-Row, WESTMINSTER.

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AN EXPERIMENTAL COURSE OF ASTRONOMY.

*W*HEREBY *ſuch a competent Knowledge of that noble Science may be attain'd to, by only attending ſixteen Lectures; that Perſons, whoſe Buſineſs, or other Avocations, will not permit them to apply to that Study, may, in a Month's time (by Help of ſeveral new* Machines *and* Experiments *purpoſely contriv'd) make themſelves better acquainted with the* Syſtem of the World, *the Reaſons and phyſical Cauſes of the* Appearances *and* Motions *of the* Heavenly Bodies, *the Nature of* Eclipſes, *and the Uſe of* Globes *and* Maps, *than by a Year's Application to Books and common Globes.*

Perform'd by JOHN-THEOPHILUS DESAGULIERS, LL. D. *Chaplain to his Grace the Duke of* Chandos, *and* F. R. S. *at his Houſe in* Channel-Row, WESTMINSTER.

LECTURE I.

CONCERNING the *Solar* SYSTEM, wherein the Order, Magnitude, Denſities, Diſtances, and Revolutions of the ſeveral Bodies in our *Syſtem* are conſider'd: And the Nature of the *Sun* and fix'd *Stars*, *Planets*, *Comets*, and the *Tails of Comets*, is ſhewn and explain'd by proper Machines and Experiments.

LECTURE II.

A Diſſection of the *Eye*, with an Account of the Manner of *Viſion*; the Faults of bad Eyes and Helps for them; and the Manner of judging of *Motions* and *Diſtances* in the Heavens.

LECTURE III.

SEVERAL Sorts of *Teleſcopes* ſhewn and explain'd; as alſo the Manner of knowing *how much* any Teleſcope *magnifies*, *how much it takes in*; and how to chooſe *Glaſſes* for Teleſcopes, and manage them according to the ſeveral *Objects* that are to be look'd at; with an Account of the *ſeveral Diſcoveries* made by Teleſcopes.

LECTURE IV.

OF the three famous *Syſtems of the World*. The Inconſiſtency of PTOLEMY's and TYCHO BRAHE's *Syſtems*; with an Account of the Obſervations that prove the COPERNICAN *Syſtem*, and ſatisfactory Anſwers to all the Objections againſt it, whether taken from *Holy Scripture*, or from *Aſtronomical Writers*.

LECTURE V.

OF the Manner of meaſuring the *Magnitude* of the EARTH, and the *Diſtance* and *Magnitude* of the MOON, and other *Heavenly Bodies* ----- and conſequently, what is meant by the *Parallax*; with *Machines* for explaining the ſeveral Sorts of *Parallaxes*. How far we are certain in relation to the *Sun's Diſtance*; and what Kind of Obſervations are requiſite to determine it.

LECTURE VI.

WHICH ſhews what would be the *moſt ſimple Aſtronomy*, namely that which ſuppoſes the *Obſerver's Eye* in the *Sun's Center*; and how the *Phœnomena* of the World would appear in that Caſe: As alſo how they would appear to *an Eye plac'd on the Sun's Surface*.

LECTURE VII.

SHEWING what muſt be the *Appearances*, ſuppoſing an *Obſerver* ſucceſſively plac'd in MERCURY, VENUS, the EARTH, MARS, JUPITER, or SATURN------ with regard to *Day and Night*, *Seaſons of the Year*; and the apparent *Motions* of the *other Bodies*, as they are ſaid to be *direct*, *ſtationary*, or *retrograde*.

LECTURE VIII.

SHEWING what would be the Aſtronomy in a *Satellite*, as, for Example, in the MOON; and what it would be, if *the Eye was ſuppoſed in a* COMET.

Of the particular *Figure of the Earth*, and ſome of the Heavenly Bodies which are not truly *ſpherical.*

LECTURE IX.

OF the *Aſtronomy of the* EARTH in particular; and firſt of the *Terreſtrial* and *Cœleſtial Globes*, with the imaginary *Circles* made uſe of to ſolve the common *Phœnomena*; and the Uſes of thoſe Circles.

LECTURE X.

OF *right* and *oblique* ASCENSION, DECLINATION, AZIMUTH and AMPLITUDE: And of the *right*, *oblique*, and *parallel* SPHERES.

LECTURE XI.

EXPERIMENTS to ſhew, that the *Appearances* that were thought to depend on the *Sun's Motion*, are better explain'd by the *Motions of the Earth*------ as the *Change of Day and Night* by the *diurnal Motion*, the *Encreaſe* and *Decreaſe* of *Days* which depend upon the *annual Motion*. And that inſtead of the *proper Motion* of the *fix'd Stars*, which was made uſe of to account for the *Præceſſion* of the *Æquinoxes*; the Alteration of the *Direction* of the *Earth-Axis*, in reſpect of the *Pole-Star*, is the true Way to ſolve that *Appearance* ------ with ſome *Phœnomena* depending upon the Change of the Place of the *Poles* of the *Æquator* among the *fix'd Stars*.

LECTURE XII.

CONCERNING the *Laws* of MOTION neceſſary to be known, in order to underſtand how the *Heavenly Bodies* are acted upon and carried round in their *Orbits.* Experiments to prove thoſe *Laws* and their *Effects* —— The *Laws* of GRAVITY, and what is meant by CENTRIPETAL and CENTRIFUGAL *Forces* —— And likewiſe to ſhew that the CARTESIAN *Hypotheſis*, in which the *Planets* are ſuppos'd to be carried along in WHIRLPOOLS of *fluid Matter*, is not only *falſe*, but *impoſſible*.

LECTURE XIII.

EXPERIMENTS to ſhew, how the *Regularity* of the *Cœleſtial Motions* depends upon the *Action of Gravity* —— and in what Manner it cauſes the *Comets* and *Planets* to *accelerate* their Motion, as they approach towards *the* SUN, and *retard* it as they *recede* from *the* SUN —— With an Explanation of the *Ebbing* and *Flowing* of the SEA; and how far the *Sun* and *Moon*, according to their different Poſitions, influence the TIDES, and produce that great *Variety of Phœnomena* that is obſerv'd in them.

LECTURE XIV.

HOW to obſerve the apparent Diſtance of two or more *Stars* —— The Appulſes of the *Moon* to the fix'd *Stars.* The Paſſage of VENUS or MERCURY over the SUN's *Disk* —— The SUN's *Spots* —— The *apparent Diameters* of the SUN, and the MOON, and of the PLANETS.

LECTURE XV.

EXPERIMENTS to ſhew the ſeveral PHASES, or different *Appearances*, of SATURN, VENUS, MERCURY, and the MOON, and the Nature of all Kinds of ECLIPSES; ſuch as *the ſmall Parts of* JUPITER and SATURN, by the *Shadows* of their SATELLITES; of the ECLIPSES of the *Satellites, by each other's Shadows*, and by the *Shadows* of their PRIMARIES; and more particularly explaining the SOLAR and LUNAR ECLIPSES.

☞ *The Charge of going through this Courſe is Three Guineas; One Guinea, is to be paid at the Time of Subſcription, and the Remainder the firſt Day of the Courſe.*

FINIS.